

ISCE-GII 2012 Research Support Program

Summaries of Projects Selected for Funding

Plutonium production in the Democratic People's Republic of Korea before 2003 and antineutrino reactor safeguards

Patrick Huber, Associate Professor, Department of Physics

The first North Korean nuclear crisis had its origin in the question of how much plutonium North Korea had separated prior to 1992 and reached its climax in 1994. We investigate how a novel, emerging technology, so-called antineutrino reactor safeguards, might have been able to resolve this question early in the process. Nuclear reactors derive their energy from the fission of fissile isotopes of uranium and plutonium; the resulting fission fragments are highly radioactive and decay via the emission of antineutrinos. The energy distribution of antineutrinos depends on the ratio of uranium to plutonium fissions and therefore, a precise measurement of this energy distribution allows determination of the total number of fissions as well as the amount of plutonium present in a reactor. Since antineutrinos are highly penetrating, this measurement can be performed without modifications to the reactor at a distance of several tens of meters. In a second part of this study we will assess the potential impact this improved estimate might have had on the course of the crisis. A key element will be interviews with some of the key actors on the side of the U.S. State Department and the IAEA.

Religion and Political Violence: Twentieth Century Latin American and the Middle Eastern Discourses on Religious Justifications of Political Violence

Bettina Koch, Associate Professor, Political Science

The project builds on the empirical evidence that suggests a link between violence and religion. It analyzes hegemonic and anti-hegemonic discourses in which religion is used to justify political violence in twentieth century Latin America (Christianity) and the Middle East (Islam). By considering religion rather as a means to an end and not necessarily as the main cause of violent conflicts, its aim is to uncover the underlying socio-economic and political tensions to which violence seems to be at least one plausible response. The project's goal is twofold: First, it intends to understand how these discourses work and under what circumstances religion is successfully applied to justify political violence. Second, it aims to identify whether similar patterns of justification can be located in both religious cultures. Understanding these discourses on violence and their underlying conflicts opens opportunities to interrupt these circles of violence and may provide insights for foreign policy strategies and, if necessary, international interventions that target the problem and not simply a conflict's symptoms.

Security, Conflict, and Environmental Manipulation in the Middle East

Ariel Ahran, Assistant Professor, School of Public and International Affairs (National Capitol Region)

Middle Eastern states have long sought to manipulate elements of the natural world, such as a water and arable land, to render their populations more legible, productive, and-- most importantly-- governable. Though altering the environment is aimed to suit the state, dams,

irrigation canals, wetland reclamation, and other forms of environmental engineering can have untold consequences for society and even incite violent resistance by those adversely affected by government plans. Examining cases in Egypt, Turkey, Israel, and Iraq, this project aims to elucidate the different ways democratic and autocratic regimes approach environmental manipulation, how they anticipate and deal with blowback, and whether such responses escalates to the point of armed conflict.

Global Age-Friendly Communities Initiative: Policy in Action for Active Aging

Eunju Hwang, Assistant Professor, and Julia Beamish, Professor, Department of Apparel, Housing and Resource Management, Virginia Tech, Andrew Sixsmith, Professor, Simon Fraser University, Ernest Chui, Associate Professor, University of Hong Kong, and Seong-hahn Koh, Senior Research Fellow, Jeju Development Institute, Korea

The number of seniors in the United States is expected to double within the next 20 years and the global population of adults over the age of 60 is also expected to double by 2050. The challenge of population aging requires innovative approaches to enable seniors to remain in their home as long as possible (aging-in-place). Nevertheless, the role of supportive environments on aging-in-place has only recently begun to be explored. Further examination is required into the connection between current housing and social policies and aging-in-place and healthy aging. This study examines the relationship between age-friendly environments and aging-in-place with the knowledge generated by analysis of an existing European ENABLE-AGE database. Our specific objectives are to conceptualize the interrelationships between environmental and individual factors and aging-in-place; examine the relationships between home adaptations, assistive devices and technical aids and aging-in-place; and investigate the relationship between provision of social services and aging-in-place. The research results will produce outcomes that will contribute to global health, housing, and aging issues.